CLAIMS:

1. A system for transferring power without requiring direct electrical conductive contacts, the system comprising:

i) a primary unit including a substantially laminar charging surface and at least one means for generating an electromagnetic field, the means being distributed in two dimensions across a predetermined area in or parallel to the charging surface so as to define at least one charging area of the charging surface that is substantially coextensive with the predetermined area, the charging area having a width and a length on the charging surface, wherein the means is configured such that, when a predetermined current is supplied thereto and the primary unit is effectively in electromagnetic isolation, an electromagnetic field generated by the means has electromagnetic field lines that, when averaged over any quarter length part of the charging area measured parallel to a direction of the field lines, subtend an angle of 45° or less to the charging surface in proximity thereto and are distributed in two dimensions thereover, and wherein the means has a height measured substantially perpendicular to the charging area that is less than either of the width or the length of the charging area; and

ii) at least one secondary device including at least one electrical conductor;

wherein, when the at least one secondary device is placed on or in proximity to a charging area of the primary unit, the electromagnetic field lines couple with the at least one conductor of the at least one secondary device and induce a current to flow therein.

2. A system as claimed in claim 1, wherein the means comprises at least one electrical conductor that is distributed in two dimensions in or substantially parallel to the charging surface.

3. A system as claimed in claim 1, wherein the means comprises at least one electrical conductor wound onto at least part of a magnetically permeable former that is distributed in two dimensions in or substantially parallel to the charging surface.

4. A system as claimed in any preceding claim, wherein the means includes a plurality of conductors configured so as to cause a directional component of the electromagnetic field lines, resolved onto the charging area, to be changed over time.

5. A system as claimed in claim 4, wherein the plurality of conductors is configured so as to cause the resolved directional component of the field lines to be switched between at least two different directions.

6. A system as claimed in claim 4, wherein the plurality of conductors is configured so as to cause the resolved directional component of the field lines to be moved through an angle.

7. A system as claimed in claim 6, wherein the plurality of conductors is configured so as to cause the resolved directional component of the field lines to be rotated.

8. A system as claimed in any preceding claim, wherein the field lines over a given charging area are substantially parallel to each other when projected onto the charging area.

9. A system as claimed in any preceding claim, wherein an instantaneous net flow of current in a given one of the at least one means when energised is in substantially one direction.

10. A system as claimed in any preceding claim, wherein the means does not project beyond the charging surface.

11. A system as claimed in any preceding claim, wherein the at least one charging area is provided with a substrate of a magnetic material.

12. A system as claimed in any preceding claim, wherein the primary unit includes at least one selectively operable capacitor configured such that a capacitance of a circuit including the at least one means for generating an electromagnetic field and the at least one capacitor may be changed in response to a detected presence of one or more secondary devices.

13. A system as claimed in any preceding claim, wherein the at least one charging area is provided with a flux guide having a relative permeability less than that of the core of the at least one secondary device.

14. A system as claimed in any preceding claim, wherein the primary unit includes a power supply.

15. A system as claimed in any preceding claim, wherein the at least one conductor in the secondary device is wound about a core that serves to concentrate flux therein.

16. A system as claimed in claim 15, wherein the core is a magnetically permeable material.

17. A system as claimed in claim 16, wherein the core is an amorphous magnetic material.

18. A system as claimed in claim 17, wherein the core is a substantially non-annealed amorphous magnetic material.

19. A system as claimed in any one of claims 15 to 18, wherein the core is formed as a flexible ribbon.

20. A system as claimed in any preceding claim, wherein the secondary device comprises an inductively rechargeable battery or cell.

21. A system as claimed in claim 20, wherein the inductively rechargeable battery or cell includes at least one conductor wound about a flux concentrating means.

22. A system as claimed in any preceding claim, wherein at least one of the at least one means is configured to generate an electromagnetic field over more than one charging area.

23. A system as claimed in any one of claims 1 to 21, wherein a plurality of means is configured to generate an electromagnetic field over a single charging area.

24. A system as claimed in any preceding claim, wherein the means has a height that is no more than half of the length or half of the width of the charging area.

25. A system as claimed in any preceding claim, wherein the means has a height that is no more than 1/5 of the length or 1/5 of the width of the charging area.

26. A primary unit for transferring power without requiring direct electrical conductive contacts, the primary unit including a substantially laminar charging surface and at least one means for generating an electromagnetic field, the means being distributed in two dimensions across a predetermined area in or parallel to the charging surface so as to define at least one charging area of the charging surface that is substantially coextensive with the predetermined area, the charging area having a width and a length on the charging surface, wherein the means is configured such that, when a predetermined current is supplied thereto and the primary unit is effectively in electromagnetic isolation, an electromagnetic field generated by the means has electromagnetic field lines that, when averaged over any quarter length part of the charging area measured parallel to a direction of the field lines, subtend an angle of 45° or less to the charging surface in proximity thereto and are distributed in

two dimensions thereover, and wherein the means has a height measured substantially perpendicular to the charging area that is less than either of the width or the length of the charging area.

27. A primary unit as claimed in claim 26, wherein the means comprises at least one electrical conductor that is distributed in two dimensions in or substantially parallel to the charging surface.

28. A primary unit as claimed in claim 26, wherein the means comprises at least one electrical conductor wound onto at least part of a magnetically permeable former that is distributed in two dimensions in or substantially parallel to the charging surface.

29. A primary unit as claimed in any one of claims 26 to 28, wherein the means includes a plurality of conductors configured so as to cause a directional component of the electromagnetic field lines, resolved onto the charging area, to be changed over time.

30. A primary unit as claimed in claim 29, wherein the plurality of conductors is configured so as to cause the resolved directional component of the field lines to be switched between at least two different directions.

31. A primary unit as claimed in claim 29, wherein the plurality of conductors is configured so as to cause the resolved directional component of the field lines to be moved through an angle.

32. A primary unit as claimed in claim 31, wherein the plurality of conductors is configured so as to cause the resolved directional component of the field lines to be rotated.

33. A primary unit as claimed in any one of claims 26 to 32, wherein the field lines over a given charging area are substantially parallel to each other when projected onto the charging area.

34. A primary unit as claimed in any one of claims 26 to 33, wherein an instantaneous net flow of current in a given one of the at least one means when energised is in substantially one direction.

35. A primary unit as claimed in any one of claims 26 to 34, wherein the means does not project beyond the charging surface.

36. A primary unit as claimed in any one of claims 26 to 35, wherein the at least one area is provided with a substrate of a magnetic material.

37. A primary unit as claimed in any one of claims 26 to 36, including at least one selectively operable capacitor configured such that a capacitance of a circuit including the at least one means for generating an electromagnetic field and the at least one capacitor may be changed in response to a detected presence of one or more secondary devices.

38. A primary unit as claimed in any one of claims 26 to 37, wherein the primary unit includes a power supply.

39. A primary unit as claimed in any one of claims 26 to 38, wherein the at least one area is provided with a flux guide having a relative permeability less than that of any core that may be provided in the at least one secondary device.

40. A primary unit as claimed in any one of claims 26 to 39, wherein at least one of the at least one means is configured to generate an electromagnetic field over more than one charging area.

41. A primary unit as claimed in any one of claims 26 to 39, wherein a plurality of means is configured to generate an electromagnetic field over a single charging area.

42. A primary unit as claimed in any one of claims 26 to 41, wherein the means has a height that is no more than half of the length or half of the width of the charging area.

43. A primary unit as claimed in any one of claims 26 to 42, wherein the means has a height that is no more than 1/5 of the length or 1/5 of the width of the charging area.

44. A method of transferring power in a non-conductive manner from a primary unit to a secondary device, the primary unit including a substantially laminar charging surface and at least one means for generating an electromagnetic field, the means being distributed in two dimensions across a predetermined area in or parallel to the charging surface so as to define at least one charging area of the charging surface that is substantially coextensive with the predetermined area, the charging area having a width and a length on the charging surface, the means having a height measured substantially perpendicular to the charging area that is less than either of the width or the length of the charging area, and the secondary device having at least one electrical conductor; wherein:

i) an electromagnetic field, generated by the means when energised with a predetermined current and measured when the primary unit is effectively in electromagnetic isolation, has electromagnetic field lines that, when averaged over any quarter length part of the charging area measured parallel to a direction of the field lines, subtend an angle of 45° or less to the charging surface in proximity thereto and are distributed in two dimensions over the at least one charging area when averaged thereover; and

ii) the electromagnetic field links with the conductor of the secondary device when this is placed on or in proximity to the charging area.

45. A method according to claim 44, wherein the means comprises at least one electrical conductor that is distributed in two dimensions in or substantially parallel to the charging surface.

46. A method according to claim 44, wherein the means comprises at least one electrical conductor wound onto at least part of a magnetically permeable former that is distributed in two dimensions in or substantially parallel to the charging surface.

47. A method according to any one of claims 44 to 46, wherein a directional component of the electromagnetic field lines, resolved onto the charging area, is changed over time.

48. A method according to claim 47, wherein the resolved directional component of the field lines is switched between at least two different directions.

49. A method according to claim 47, wherein the resolved directional component of the field lines is moved through an angle.

50. A method according to claim 49, wherein the resolved directional component of the field lines is rotated.

51. A method according to any one of claims 44 to 50, wherein the field lines over a given charging area are substantially parallel to each other when projected onto the charging area.

52. A method according to any one of claims 44 to 51, wherein an instantaneous net flow of current in a given one of the at least one means when energised is in substantially one direction.

53. A method according to any one of claims 44 to 52, wherein the at least one charging area is provided with a substrate of a magnetic material and wherein the magnetic material completes a magnetic circuit.

54. A method according to any one of claims 44 to 53, wherein the primary unit includes at least one selectively operable capacitor that is switched in or out such that a capacitance of a circuit including the at least one primary unit means for generating an electromagnetic field and the at least one capacitor may be changed in response to a detected presence of one or more secondary devices.

55. A method according to any one of claims 44 to 54, wherein the charging surface, at least within the at least one charging area, is provided with a flux guide having a relative permeability less than that of any core that may be provided in the at least one secondary device.

56. A secondary device for use with the system, primary unit or method of any one of the preceding claims, the secondary device including at least one electrical conductor and having a substantially laminar form factor.

57. A secondary device as claimed in claim 56, wherein the at least one electrical conductor is wound about a core that serves to concentrate flux therein.

58. A secondary device as claimed in claim 57, wherein the core is a magnetically permeable material.

59. A secondary device as claimed in claim 58, wherein the core is an amorphous magnetic material.

60. A secondary device as claimed in claim 59, wherein the core is a substantially non-annealed amorphous magnetic material.

61. A secondary device as claimed in any one of claims 57 to 60, wherein the core is formed as a flexible ribbon.

62. A secondary device as claimed in any one of claims 56 to 61, wherein the secondary device comprises an inductively rechargeable battery or cell.

63. A secondary device as claimed in claim 57 or any claim depending therefrom, having a core thickness of 2mm or less.

64. A secondary device as claimed in claim 63, having a core thickness of 1mm or less.

65. A secondary device as claimed in any one of claims 56 to 64, wherein the secondary device has a primary axis and couples with the electromagnetic field when located on or in proximity to the charging area in any rotation about its axis.

66. A secondary device as claimed in claim 65 depending from claim 62, wherein the core is at least partially wrapped around a central part of the battery or cell.

67. A system as claimed in any one of claims 1 to 25, wherein the primary unit includes a pair of conductors having adjacent coplanar windings which have mutually substantially parallel linear sections arranged so as to produce a substantially uniform electromagnetic field extending generally parallel to the plane of the windings but substantially at right angles to the parallel sections.

68. A system as claimed in claim 67, wherein the windings are formed in a generally spiral shape, comprising a series of turns having substantially parallel straight sections.

69. A system as claimed in claim 67 or 68, wherein the primary unit includes first and second pairs of conductors which are superimposed in substantially parallel planes with the substantially parallel linear sections of the first pair arranged

generally at right angles to the substantially parallel linear sections of the second pair, and further comprising a driving circuit which is arranged to drive them in such a way as to generate a resultant field which rotates in a plane substantially parallel to the planes of the windings.

70. A primary unit as claimed in any one of claims 26 to 43, including a pair of conductors having adjacent coplanar windings which have mutually substantially parallel linear sections arranged so as to produce a substantially uniform electromagnetic field extending generally parallel to the plane of the windings but substantially at right angles to the parallel sections.

71.. A primary unit as claimed in claim 70, wherein the windings are formed in a generally spiral shape, comprising a series of turns having substantially parallel straight sections.

72. A primary unit as claimed in claim 70 or 71, including first and second pairs of conductors which are superimposed in substantially parallel planes with the substantially parallel linear sections of the first pair arranged generally at right angles to the substantially parallel linear sections of the second pair, and further comprising a driving circuit which is arranged to drive them in such a way as to generate a resultant field which rotates in a plane substantially parallel to the planes of the windings.

73. A system for transferring power, substantially as hereinbefore described with reference to Figures 4 to 13 of the accompanying drawings.

74. A primary unit for transferring power, substantially as hereinbefore described with reference to Figures 4 to 13 of the accompanying drawings.

75. A method of transferring power, substantially as hereinbefore described with reference to Figures 4 to 13 of the accompanying drawings.

76. A secondary device for receiving power, substantially as hereinbefore described with reference to Figures 4 to 13 of the accompanying drawings.